

In the claims:

1. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit for:

defining respective party's goal program in respect of said outcome, said goal program comprising at least one objective function, having at least one goal expressed by at least one constraint comprising at least one of a deviation variable, a decision variable and a target value, said deviation variable being usable to form said objective function,

for associating each of said objective functions with a level of importance, and

for assigning each of said goals an importance weighting within its level, and

for assigning to deviation variables within each objective function a respective importance weighting, said party goal program unit comprising a party input unit for allowing a party to provide data for a respective goal program,

a negotiator associated with said party goal program unit for receiving a goal program of at least one of said respective parties, and carrying out negotiations using said at least one goal program by considering said objective functions levelwise in the respective goal program to approach at said mutually compatible outcome by carrying out minimization at a respective level, therewith to form an offer,

an output unit for offering said offer to said respective parties,

a response receiver for receiving from respective parties either counter offers or acceptances, said response receiver being operable to provide counter offers expressed as modified goal programs to said goal program negotiator for further negotiation, said platform advancing to a next level upon an acceptance.

2. (Original) The platform of claim 1, further comprising a goal program unifier, associated with said party goal program unit for receiving goal programs of respective parties, and carrying out unification of said goal programs to determine whether two goal programs have a common field of interest from which a mutually compatible outcome is derivable.

3. (Original) The platform of claim 1, wherein said party goal program unit comprises a constraint arrangement unit for arranging goal constraints levelwise

in a first party's goal program such that conditional weakening from said outcome for a goal in a trade-off involves strengthening of other goals within the same level of said first party.

4. (Original) The platform of claim 1, wherein said goal program unit comprises a trade-off unit for arranging goals levelwise in a first party's goal program such that goals of a given level are negotiated with goals of a same level of another party.

5. (Original) The platform of claim 1, wherein said party goal program unit is operable to place said objective functions in a hierarchy according to the respective associated level of importance, and to express each goal in terms of at least one decision variable and at least one deviation variable.

6 - 23. (Canceled)

24. (Original) The platform of claim 1, wherein said party input unit is operable to request a decision variable interval, and a penalty specification for deviating from a target within said interval, and wherein said unifier is operable to define a working interval as an intersection between respective intervals of two parties.

25 - 31. (Canceled)

32. (Original) The platform of claim 1, wherein said party input unit is operable to permit a party to define at least one single dimension interval goal in respect of said outcome, and to associate said goal with a range of indifference having an upper bound and a lower bound, a first weighting value for deviations below said lower bound, a second weighting value for deviations above said upper bound and a relative importance for said goal,

said unifier being operable to use said range of indifference, said weightings and said relative importance to unify said at least one goal with at least one other goal to determine said compatibility.

33. (Canceled)

34. (Original) The platform of claim 1, wherein said party input unit is operable to permit a party to define a two dimensional trade-off goal constraint by entering two two-dimensional points, said party goal program unit being operable to define a trade-off line between said two points.

35 - 44. (Canceled)

45. (Currently Amended) The platform of claim 1, wherein said party input unit is operable to permit parties to define goals comprising pairwise variable trade-offs having at least two points and a trade-off function defined for distance from a line joining said points, and wherein said party goal program unit is operable to prevent inconsistent trade-offs to be defined within the platform by preventing said party input unit from accepting more than one trade-off from referring, directly or indirectly, to any given pair of decision variables.

46 -47. (Canceled)

48. (Original) A platform according to claim 1, wherein said party input unit further comprises a trade-off unit, wherein said party input unit is further operable to allow a party to define disjunctive constraints in respect of decision variables, and wherein said goal program unit comprises a disjunctive constraint processor, associated with said trade-off unit, for translating a disjunctive expression into a plurality of conjoined expressions, and wherein said unifier is operable to utilize said conjoined expressions to unify said at least one disjunctive constraint with other constraints to determine said compatibility.

49 - 59. (Canceled)

60. (Original) A platform according to claim 1, wherein said party input unit is further operable to allow input of variables in association with said objective functions and a linkage between a first and a second of said variables, said linkage defining a trade-off line and deviations thereof with respect to said target values, said negotiator being operable to use said series of variables including said trade-off line to negotiate an outcome in respect of said at least one objective function with other objective functions, thereby to arrive at formation of an offer.

61 - 80. (Canceled)

81. (Currently Amended) The platform of claim 1, wherein said goal program unit further comprises a unifier, and the unifier ~~further~~ comprises a goal program input unit for receiving a local party's goal program and an opponent's goal program to be unified therewith, said goal programs comprising objective functions associated with deviation variables of goal constraints and being arranged in levels, and the negotiator further comprises:

an optimizer for finding best solutions to goal programs, connected to find best values for said objective functions and constraints of said local party's goal program levelwise, and

a worst case calculator for finding worst solutions for goal programs, connected to find worst values for said objective functions and constraints of said opponent's goal program levelwise,

said negotiator being operable to:

use said optimizer and said worst case calculator in succession, level by level to produce successive value sets for evaluation therefrom to form level by level unification offers, and

advance from one level to another level only following acceptance by said parties of a unification offer regarding a previous level.

82 - 91. (Canceled)

92. (Original) The platform of claim 1, wherein the negotiator further comprises a goal program input unit for receiving a local party's goal program, said

goal program comprising objective functions associated with deviation variables of goal constraints and being arranged in levels, and said negotiator further comprises:

an optimizer for finding best solutions to goal programs, connected to find best values for said objective functions of said local party's goal program levelwise, and

a stay close processor for determining variable improvement directions from monitoring of received offers from said opponent and carrying out value perturbations in said directions,

said negotiator being operable to:

use said optimizer to produce a first offer for a first level,

to advance from one level to another level only following acceptance by said parties of an offer regarding a previous level, and

use said stay close processor to produce a subsequent offer, thereby to arrive at said outcome.

93 - 99. (Canceled)

100. (Currently Amended) The platform of claim 1, further comprising a unifier within said goal program unit, and wherein said unifier further comprising comprises a negotiation necessity tester, associated with said unifier, for joint solving of said local and said other goal program to form a joint goal program comprising optimal solutions for each of said local and said other goal program, said negotiation necessity tester being set to determine whether there lies a single solution that includes both optimal solutions within said common ground, and if so, to inhibit passing of said goal programs to said negotiator.

101- 122. (Canceled)

123. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit for allowing each party to define a plurality of goals in respect of said outcome, and to associate each of said goals with a respective level of importance, therefrom to form for each party a goal program,

said party input unit being operable to obtain a target value and upper and lower bounds relating to at least one of said goals, said party goal program unit being operable to use said upper and lower bounds to express deviations from said target values in relative terms, thereby to render deviations from different goals' targets comparable.

124. (Canceled)

125. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit for allowing a party to define a plurality of goals in respect of said outcome, and to associate at least one of said goals with a target value, an acceptable interval, and a penalty for deviation from said target value, and

a unifier, for determining common ground between said goal program and at least one other goal program,

and a negotiator, operable to form offers within said common ground by mutual quantifying of an objective function of said at least one goal program with objective function of said at least one other goal program having a target value and an interval, by determining an intersection between said intervals and if said target value is outside said intersection then moving said target value by a deviation amount to a closest boundary of said intersection, said negotiator further being operable to apportion said penalty for deviation amount in accordance with an extent of said deviation of said target value.

126 – 137. (Canceled)

138. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit for allowing a party to define at least one goal program having a plurality of goals in respect of said outcome, and to associate a goal constraint of at least one of said goals with a range of indifference having an upper bound and a lower bound, a first weighting value for deviations below said lower bound, a second weighting value for deviations above said upper bound and a relative importance for said goal constraints,

and a negotiator, associated with said goal program unit, said negotiator being operable to use said range of indifference, said weightings and said relative importance to obtain an outcome for said at least one goal in view of other goals, by producing successive offers.

139 - 145. (Canceled)

146. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit operable to permit a party to define a two dimensional trade-off goal constraint by entering two two-dimensional points, said party goal program unit being operable to define a trade-off line between said two points, and

a negotiator, associated with said goal program unit, said negotiator being operable to use said trade-off line to solve said goal program containing said at least one trade-off goal constraint taking into account other constraints to arrive at said outcome via a series of successive offers.

147 - 157. (Canceled)

158. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit for allowing a party to define at least one single dimension two-point goal constraint in respect of said outcome, and to associate said goal constraint with an upper point of preference, and a lower point of preference, a first weighting value for deviations below said lower point of preference, and a second weighting value for deviations above said upper point of preference, said goal program unit being operable to provide weightings to a region included between said points of preference by assigning said first weighting value below said upper point of preference and said second weighting value above said lower point of preference and defining an overall weighting within said region as a minimum of said weighting values,

and a negotiator, associated with said goal program unit, said negotiator being operable to use said included region, said weightings, and said minimum to consider

said at least one goal constraint with other goal constraints to arrive at successive offers to achieve said outcome.

159 - 166. (Canceled)

167. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit operable to permit parties to define goal constraints comprising pairwise variable trade-offs having at least two points and a trade-off function for deviating from a line drawn between said points, wherein said party goal program unit is operable to prevent inconsistent inclination values to be defined within the platform by preventing said party input unit from accepting more than one trade-off that refers directly or indirectly to a same pair of variables,

and a negotiator for negotiating with other parties via goal programs to achieve an outcome consistent with said constraints.

168. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit operable to permit parties to define constraints relating to pairwise trade-offs having at least two points and a trade-off function for deviations from a line extending therebetween, wherein said party goal program unit is operable to warn users of inconsistent inclination values by outputting a warning whenever a trade-off being entered refers directly or indirectly to a pair of variables already included in a previously entered trade-off, and

a negotiator for negotiating with other goal programs to achieve an outcome consistent with said constraints.

169. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit for allowing a party to define at least one objective function in respect of said outcome, and to associate said objective function with a series of variables and disjunctive constraints, said goal

program unit comprising a disjunctive constraint processor for translating a disjunctive expression into at least one linear conjunctive expression,

and a negotiator, associated with said goal program unit, said negotiator being operable to use said series of variables including said linear conjunctive expression to negotiate an outcome consistent with said goal program and with other goal programs.

170 - 173. (Canceled)

174. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit for allowing each party to define a plurality of goals in respect of said outcome, each goal comprising a plurality of deviation variables associated with decision variables, therefrom to form for each party a goal program, wherein a variable having discrete values is predefined, and wherein said party input unit is operable to receive allowed discrete values of said variable for use in said objective function definition,

a unifier, associated with said party goal program unit for receiving goal programs of respective parties, said goals including discrete values of said variable, said unifier being operable to carry out unification of said goal programs by considering said discrete values to arrive at a common region of said discrete variables amongst said goal programs, and

a negotiator operable to utilize fulfillment levels associated with said discrete values to produce successive offers to converge on an outcome within said common region.

175 - 185. (Canceled)

186. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit comprising a party input unit for allowing a party to define at least one objective function and at least one associated goal constraint in respect of said outcome, and to associate said goal constraint with at least two variables, said party input unit further allowing input of a linkage between a first and

a second of said variables, said linkage defining a trade-off of deviations with respect to said target values,

a unifier, associated with said goal program unit, said unifier being operable to use said series of variables to unify said at least one goal constraint with other constraints to find a common area of interest, and

a negotiator, associated with said unifier, for using said trade-off to find a mutually acceptable outcome within said common area.

187.-198. (Canceled)

199. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit for defining goal programs in respect of an outcome, the goal program unit comprising a party input unit for allowing a party to input data relating to said goal program, said goal program unit being operable to translate said values into objective functions and constraints on said objective functions within said goal program,

and a negotiator, associated with said goal program unit, said negotiator comprising an optimizer to find best values for said objective functions under constraints, therewith to obtain a best solution for the goal program for output as a first offer, and then iteratively to produce further solutions until an offer is accepted, thereby to achieve said outcome.

200 - 214. (Canceled)

215. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

a party goal program unit for defining goal programs in respect of an outcome, the goal program unit comprising a party input unit for allowing a party to input values, said goal program unit being operable to translate said values into objective functions and constraints on said objective functions within said goal program,

and a negotiator, comprising a solution sorter for comparing goal program solutions by evaluation of said goal program for each one of a series of proposed

solutions and ranking the solutions according to said evaluations, said negotiator being operable to use said ranking to apply preference to different solutions.

216 - 224. (Canceled)

225. (Original) A platform for supporting negotiation between a local party and an opponent party to achieve an outcome, the platform comprising:

a goal program input unit for receiving a local party's goal program and an opponent's goal program to be unified, said goal programs comprising objective functions associated with constraints and being arranged in successive levels,

an optimizer for finding best solutions to goal programs, connected to find best values for said objective functions and constraints of said local party's goal program levelwise, and

a worst case calculator for finding worst solutions for goal programs, connected to find worst values for said objective functions and constraints of said opponent's goal program levelwise,

said negotiator being operable to:

use said optimizer and said worst case calculator in succession level by level to produce successive best local and worst opponent value sets for evaluation therefrom to form level by level offers, and

to advance from one level to another level only following acceptance by said parties of an offer regarding a previous level.

226 - 234. (Canceled)

235. (Original) A platform for supporting negotiation between a local party and an opponent party to achieve an outcome, the platform comprising a negotiator, and

a goal program input unit for receiving a local party's goal program, said goal programs comprising objective functions associated with constraints and being arranged in levels,

the negotiator comprising:

an optimizer for finding best solutions to goal programs, connected to find best values for said objective functions under constraints of said local party's goal program levelwise, and

a stay close processor for determining variable improvement directions from monitoring of received offers from said opponent and carrying out value perturbations in said directions,

said negotiator being operable to:

use said optimizer to produce a first offer for a first level,

to advance from one level to another level only following acceptance by said parties of a unification offer regarding a previous level, and

use said stay close processor to produce a first offer for each subsequent level.

236 - 248. (Canceled)

249. (Original) A platform for joint processing of goal programs to produce an outcome, the platform comprising:

a party goal program unit for formulation of at least one local goal program,

a unifier for determining common ground between said local goal program and at least one other goal program,

a negotiation necessity tester, associated with said unifier, for joint solving of said local and said other goal program to form a joint goal program comprising optimal solutions for each of said local and said other goal program, said negotiation necessity tester being set to determine whether there lies a single solution, that is optimal for both parties, within said common ground, and if so, to indicate that no negotiation is necessary.

250. (Canceled).

251. (Original) A resource negotiator for making successive offers for usage of a resource with at least one remote party based on a goal program of a local party, the goal program comprising a plurality of objective functions, at least one of said objective functions having a goal associated with a target value, an upper bound, a lower bound and at least one constraint, the resource negotiator comprising:

an input for receiving data from said remote party,

a minimizer for producing successively worsening minimizations of said goal program, and

an offer formulator, associated with said minimizer, for formulating said minimizations into offers for resource usage for sending to said remote party.

252 - 265. (Canceled)

266. (Original) A resource negotiator for negotiating for usage of a resource with a plurality of remote parties based on a goal program of a local party, the goal program comprising a plurality of objective functions with associated goal constraints, at least one of said goal constraints having at least one variable with an upper bound, and a lower bound, the resource negotiator comprising:

an input for receiving data from said remote parties,

an objective function minimizer for calculating a value required to be provided by remote parties of said at least one objective function, and

an offer acceptor, associated with said minimizer, for receiving offers from said remote parties, comparing said calculation with said offers and for accepting one of said offers based on said minimizations.

267 - 275. (Canceled)

276. (Original) A resource negotiator for negotiating for usage of a resource with a plurality of remote parties based on a goal program of a local party, the goal program comprising at least one objective function having at least one goal comprising a variable assignable with at least one of an upper bound, and a lower bound, the resource negotiator comprising:

an active bid monitor for monitoring remote parties remaining in said negotiating,

a resource quality increaser for successively decreasing a value of said at least one predetermined objective function,

an offer acceptor, associated with said active bid monitor and with said quality increaser, for ending said negotiation at a time at which only a predetermined number of remote parties remains active, and at a corresponding value of said at least one predetermined objective function, said offer acceptor being operable to deem said

negotiation successful if said corresponding value is within any assigned bounds, said predetermined number being related to a number of available resources.

277 – 284. (Canceled)

285. (Original) A platform for performing ranking between database entries, each of said entries comprising a series of values arranged in fields, the platform comprising:

a goal program unit for taking data from a user and defining therewith a goal program, variables thereof being related to said fields, and

a ranking unit for performing ranking amongst said entries in accordance with said goal program.

286 – 300. (Canceled)

301. (Original) A platform for supporting negotiation between parties to achieve an outcome, the platform comprising:

an input for receiving an overall deal request from a first party relating to multiple items, and availability data from at least one second party relating to available items,

a deal partitioner for partitioning of said deal request into a plurality of sub-deals each corresponding to at least one item of said sub-deal request that is to be obtained from a single second party, such that said deal request overall is applicable to one or more second parties, and

a deal minimizer for selecting second parties for each sub-deal such as to minimize a cost parameter for said first buyer for said deal request.

302 – 336. (Canceled)